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Soil Conservation

SEPTEMBER 1964
VOL. XXX NO. 2

MEETING THE URBAN CHALLENGE:

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SOIL CONSERVATION SERVICE • U. S. DEPARTMENT OF AGRICULTURE

SEPTEMBER 1964
VOL. XXX, NO. 2

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Town and Country...

We heard much favorable comment after State Conservationist Ben Isgur spoke a few weeks ago to the Washington SCS staff about the unique conservation setup in Massachusetts. We asked him to describe for the rest of us (p. 27) the recent trend-setting changes in legislation there that make conservation districts (no longer limited to soil and water) a central source of assistance to both urban and rural people on all phases of resource conservation. Our lead story is the result.

Shock Reaction: Perhaps an earthquake was not necessary to shake the proposed Kodiak Island Soil Conservation Subdistrict of Alaska into action, but it helped. This is one of the interesting things we learned from State Conservationist Oliver's response (p. 30) to our inquiry about the effects of the catastrophe of March 27 on agriculture and conservation. Alaska, too, has a unique system of soil conservation districts (p. 33). Farmers reacted immediately and SCS quickly went into action to help alleviate the effects of the disaster.

Cover Picture: Conservation plantings frame the terminal of Dulles International Airport. This night photo was made by the Federal Aviation Agency.

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Unified Conservation Planning

Massachusetts brings town and country together in agencies for all resource conservation

By Benjamin Isgur
State Conservationist, Amherst, Mass.

NEW legislation in Massachusetts unifying all resource conservation efforts under the direction of a single State agency is bringing rural and urban people together as never before in meeting the growing problems of urbanization.

The State's unique conservation setup makes soil conservation districts — now called simply "conservation districts" — responsible for providing "one stop" technical service in all phases of resource conservation and land use planning.

Conservation Commission

In addition to conservation districts, cities and towns have their own "conservation commissions" responsible for taking the leadership in urban conservation programs. The commissions recommend conservation measures to be included by town planning boards in "master plans" for land use. They obtain technical services, such as soil surveys and interpretations, from the districts.

In Massachusetts, "towns" include rural as well as urban areas and are generally equivalent to townships in many other States. To date more than 200 town conservation commissions have been established within the 15 reorganized conservation districts that cover the entire State.

The pond is part of a recreation area developed by the Town of Medfield, a cooperator with the Norfolk Conservation District.

Both the districts and commissions are under the administration of the State Department of Natural Resources. A new Conservation Services Division in the department channels technical assistance to the districts and commissions.

The resulting organization of resource agencies in the State assures that every new school, park, shopping center, housing subdivision — in short every conceivable community facility—may have the entire range of conservation thinking and skills applied directly to its location, development, and protection.

District Experience

The salvage of valuable New England farmland and the designation of conservation areas dedicated to wildlife, nature trails, and open space in urban areas are also encouraged, as evidenced by scores of requests for technical assistance already received from expanding towns and villages.

Because citizens had become concerned over the increasing loss of natural resources to mushrooming housing developments, industrial sites, and the like, the Massachusetts General Court in 1957 passed the Town Conservation Commissions Act enabling cities and towns to set up "Conservation Commissions" as functional units of com-

SCS Soil Scientist Charles Upham finds wet soils and high water table a common problem in the Town of Hanover. The resource inventory points out possibility of wetland conservation and management for such areas.

munity government.

These commissions are empowered to operate municipal conservation programs and to perpetuate adequate open space. They have funds to purchase land and acquire easements. For the first time, direct lines of communication were opened between all the community governing bodies and the complete range of State, Federal, and local agencies ministering to conservation needs of both rural and urban land.

A Broadened Role

Meantime soil conservation districts had gained considerable experience in answering requests for advice on urban conservation problems. In the past two decades many a hard-pressed town selectman, mayor, or city manager had found the district supervisors and the technical people of the Soil Conservation Service a prime source of aid in coping with perplexing soil and water problems or in making land use and zoning decisions. Supervisors and soil conservationists however had grown increasingly frustrated with what was obviously a piecemeal mode of giving aid to communities.

The General Court in August 1963 amended the Soil Conservation Districts Act to broaden the role of soil and water conservation districts. It dropped the words "soil and water" from the names of the districts and placed them under the supervision of the State Department of Natural Resources already encompassing all other resource agencies within the State.

The former State Soil Conservation Committee became the "State Committee for the Conservation of Soil, Water, and Related Resources" and was enlarged to include the Commissioner of Agriculture, the chairman of the Water Resources Commission (who is also the Commissioner of Natural Resources) and the dean of the College of Agriculture. The new State Committee also includes a representative from the Massachusetts Association of Conservation Districts, the Massachusetts Association of Town Conservation Commissions, the Massachusetts State Grange, and the Massachusetts Farm Bureau. The SCS State conservationist is an advisory member.

In the language of the act, the responsibilities of conservation districts were amended to include ... "ocean, shellfish, and inland fisheries; wild birds, including song and insectivorous birds; wild mammals and game; sea and fresh water fish of every description; forests and all uncultivated flora together with public shade and ornamental trees and shrubs; land, soil, and soil resources, lakes, ponds, streams, coastal, underground, and surface waters; mineral and natural deposits."

In effect, the General Court gave conservation districts *carte-blanche* to become "one stop" headquarters for resource-guiding assistance.

Technical Services

To insure that the many specialists required for such a broad program would be readily available, the new legislation established a Division of Conservation Services in the State Department of Natural Resources. The unit serves both as a clearing house and as a communications traffic manager for requests for technical information and services. The mechanism operates to assure that resource specialist teams drawn from one or several agencies are alerted to opportunities to be of service to local jurisdictions on natural resource problems.

Conservation districts understand the advantages of the re-

source team approach in community conservation planning. Although little time has elapsed since the legislation was passed, several districts have acted to use their new authorities in carrying greater assistance to towns and cities undergoing the growth-pains of expansion.

One of the pioneering efforts at complete conservation planning took the form of direct action in 1961 at the Town of Hanover, a quaint, former shipbuilding community on the route from Boston to Cape Cod.

Worried about future growth and wanting to preserve the rural values that had attracted many of its residents, citizens of the town wanted to preserve open spaces, both for recreation and for conservation reasons. The town planning body readily grasped the opportunity offered by the supervisors of the Plymouth Conservation District to evaluate the community's soil and water potentials for natural resource development. The resulting pilot project paved the way for a significant alliance between planning consultants, the Town Conservation Commission, and SCS soil scientists.

The Hanover Report

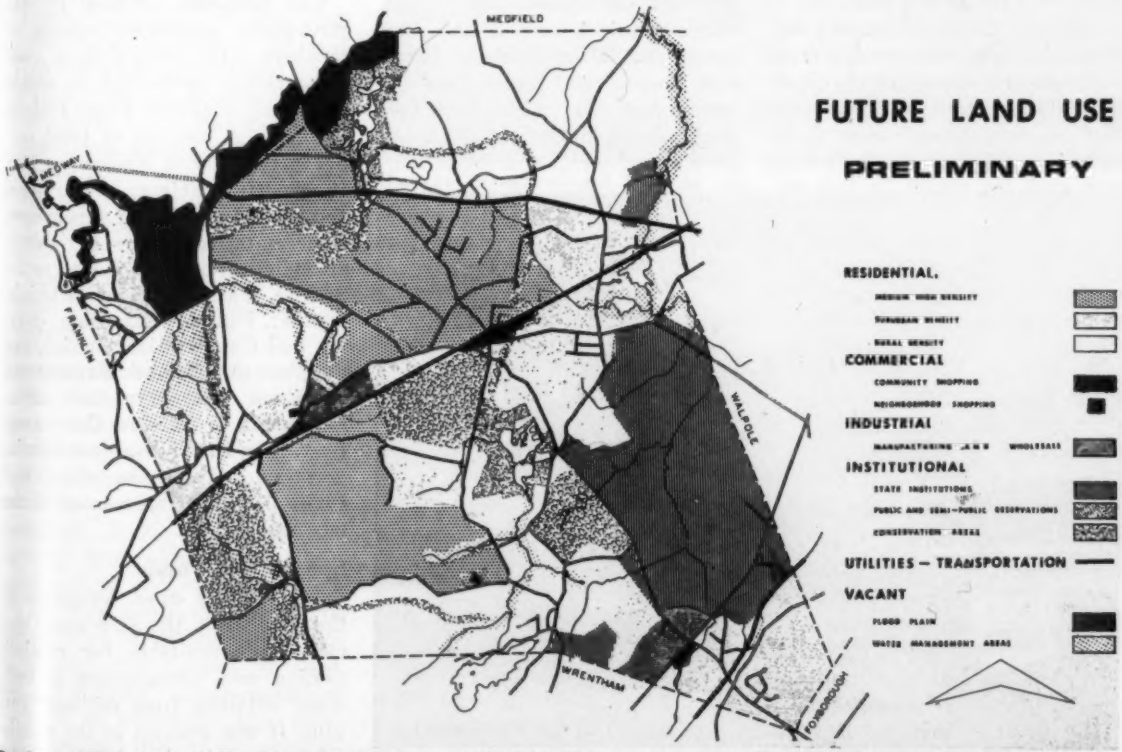
Already well along with a survey of the entire county, the SCS extended soils mapping to complete a detailed investigation of Hanover's entire area of 10,000 acres. Further, the soils men provided interpretive information indicating suitability and limitations of each acre for the full gamut of town needs, including septic tank disposal areas, homesites, athletic fields, wetland for wildlife, sources of sand and gravel, roads, woodland agriculture, and surface run-off disposal.

In accepting the conservation district's contribution toward preparation of Hanover's Master Plan, professional consultants cited the scientific "authority" of the SCS data. Soils maps and interpretations were recognized as excellent guides for decisions about road layouts, drainage, subdivision regulations, and building codes.

Published in two volumes by the Massachusetts Department of Commerce and distributed widely by the U. S. Department of Agriculture the "Hanover Report" drew attention from civic and resource agency officials throughout the United States and in several foreign countries. Inquiries from conservationists and planning interests for supplementary information were numerous.

Many Massachusetts town and

(*Continued on p. 45.*)



Portion of Future Land Use Map for the Town of Norfolk, Mass., prepared by Charles E. Downe, planning consultant, using soil survey information and resource inventory maps supplied by SCS and Massachusetts Department of Natural Resources.

A Shock to Alaska Agriculture

Earthquake damage spurs landowners to form conservation subdistrict

By William B. Oliver
State Conservationist, Palmer, Alaska

THE earthquake of last March 27 struck Alaska's limited agriculture a cruel blow, but farmers, ranchers, and agricultural agencies promptly joined efforts to repair the damage.

Ranchers on Kodiak Island, who had been considering forming a soil conservation subdistrict, were spurred to complete the action, and the Soil Conservation Service immediately made special funds available to assist them. Other USDA agencies also provided special aid to this, the most severely damaged agricultural area.

Although the agricultural enterprise of Alaska ranks rather small in the total economy of the State, it is all-important to the farmers and ranchers struggling to develop sound and profitable individual operations. Little has been said or written about the earthquake's effect on agriculture, although the story of destruction to cities and towns has been told and retold.

Kodiak Damaged

Of the agricultural areas, Kodiak Island and its adjacent islands suffered the most property and land damage. The area was extremely hard hit by the great tidal waves that battered the east shores.

Because it was early spring, most of the cattle were grazing on the beaches or in adjacent low areas. About 175 animals were drowned or washed out to sea. Three ranch houses, 1 slaughter house, and 20 or 25 sheds, barns, tool houses, and other property were swept away, along with feed grain, silage, and baled hay. About 25 miles of corral and range fencing were lost. Several hundred acres of land used for hay production was left covered with all kinds of debris and rubbish.

To add to the difficulty, Kodiak Island sank from 5 to 8 feet. As a result, beach rye areas formerly used as winter range are now covered by normal tides and ranchers were unable to produce their normal supply of winter feed. Part of the road leading from the City of Kodiak to the outlying ranches was completely destroyed, and sevveral miles of road not destroyed is now under water twice a day at high tide.

The problems created by the earthquake quickened interest of ranchers in the effort to form a soil conservation subdistrict to obtain assistance available from Federal agencies. A meeting of local people in the City of Kodiak on May 16 voted favorably on the proposal and elected a board of supervisors. Representatives of the Agricultural Stabilization and Conservation Service, Farmers Home Administration, Federal Extension Service, Soil Conservation Service, and the Bureau of Land Management explained what help their agencies could provide in the emergency. The Small Business Administration and the American Red Cross also were represented at the meeting.

Special Aid Funds

Immediately upon formation of the subdistrict, the SCS made special funds available for reconditioning and transporting a bulldozer obtained from military surplus. It was granted to the subdistrict to assist in clearing tidal wave-borne debris and in clearing

Emergency stock feed airlift to stricken areas was organized by dealers, Civil Defense, and USDA Defense Board.

and conditioning new land to replace that lost or damaged by the earthquake.

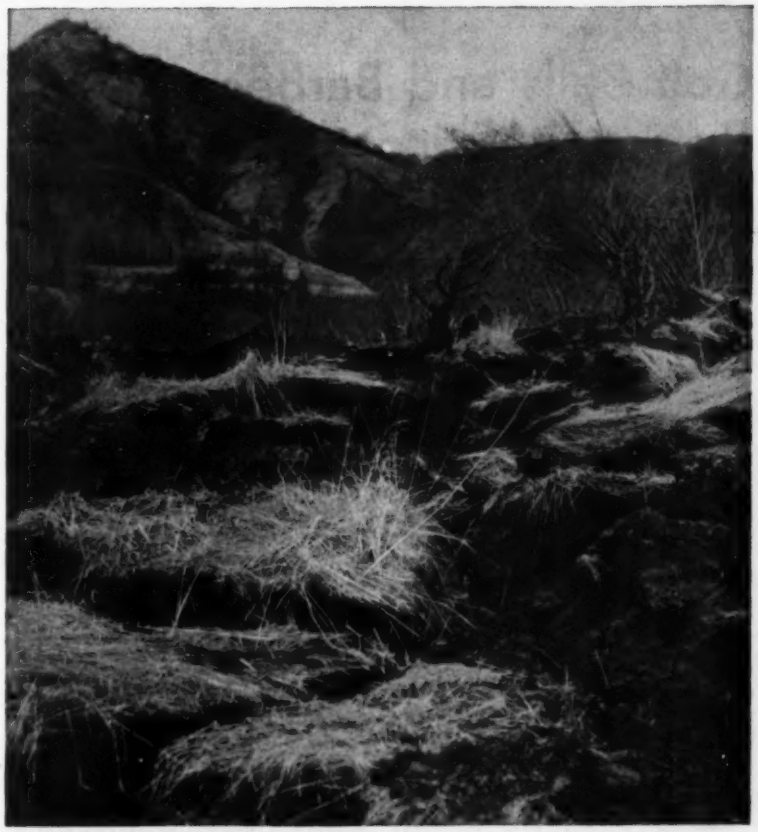
The ASCS Committee set up emergency cost-sharing practices for debris removal, fence building, and reseeding of hay and range areas. Farmers Home Administration made available low-interest emergency loans for replacing ranch buildings, rebuilding homes, and rehabilitation of hay and grazing lands.

In addition to Kodiak and adjacent islands and a few of the Aleutian Islands, Alaska's agriculture is confined largely to three general areas: The Tanana Valley between the Alaska Range on the south and the Yukon River on the north, the Matanuska-Susitna Valley in south central Alaska, and the Kenai Peninsula.

These areas had little actual property or land damage. The Tanana Valley, farthest away from the shock center, suffered the least. Wells in the Matanuska and Susitna areas were muddied and a few went partly dry. Some fields were cracked, and a few small landslides occurred in the area. On the Kenai Peninsula, in the area near Kachemak Bay, some areas of poorly drained sloping land slipped, and a number of sizable crevasses opened up where land settling occurred.

Transportation Crucial

The real emergency in these areas was due to the breakdown in transportation. At Seward and Valdez the railroad terminal and steamship docks were completely destroyed. Road bridges on the highway from Anchorage to Seward and on to Kenai had collapsed or were badly damaged. The Glenn Highway from Anchorage to Palmer was blocked by snow and rock slides. Communications were cut off within the area. Electric lines and part of the generating equipment were out of commission. Many miles of the Alaska Railroad tracks were twisted and warped out of shape.



Damage to agricultural land, as with this area of Belgua silt loam near Homer, is a little publicized effect of the earthquake.

Before the earthquake, most of the dairy farmers had been short of roughage and grain and had supplies ordered to arrive by boat and rail shipment. The Tanana Valley and Kenai Peninsula were especially hard hit by the shortage. The Mantanuska Valley area had an adequate supply of feed and fodder and shared it with the other areas as soon as transportation was available. Luckily for the Tanana Valley, the tracks from Anchorage north were temporarily repaired within weeks so feed could go to that area by rail. Feed for the stock on the Kenai Peninsula had to be flown in by the Air National Guard for 10 weeks.

Emergency feed grain programs for the Tanana Valley, the Kenai Peninsula, and Kodiak Island areas were approved by USDA to provide dairy feed in the Tanana area until harvest of fall grain crops and to supply winter feed for beef cattle on the Kenai Peninsula and Kodiak Island.

The Department of Agriculture, State, and County Defense Boards got a great deal of practical experience in assisting the Civil Defense organization during a real emergency for the 6 weeks following the earthquake. A few deficiencies showed up in the system, but generally things moved along efficiently. The experience showed that if we ever have to put emergency operations to the test again, USDA can be depended on to measure up to the challenge.

Golf Balls and Barbecue Replace Apricots

GOLF balls are dropping these days in a former 20-acre apricot orchard at Cupertino, northwest of San Jose in Santa Clara County, Calif.

It's a kind of a switch from what's happening in the orchards down south, where, 'tis said, they cross contractors with orange trees to get houses. Here, an orchardist and a plumber, Sigfrid and Albert Nelson, came up with a nine-hole golf course.

And it's proof that not all former agricultural land has to proliferate with subdivision houses.

"You just couldn't support this land with apricots any more—taxes are too high, and there's too much value for other things. But it just didn't seem right to break this up into city lots," said Sigfrid Nelson.

Having worked with the Soil Conservation Service on another orchard property, the Nelsons contacted the local soil conservation district office for SCS engineering assistance in the land use conversion. The SCS provided basic topographic data for use in the layout of the recreation development.

Blackberry Farm figured in family outings of the area nearly 100 years ago. It got its name from the 5-acre blackberry patch, which has since disappeared, developed, along with vineyard and orchard, in the tight little valley along Stevens Creek, by a man named McCaulay.

Before McCaulay, there was, briefly, McClellan. And before that Captain Elisha Stevens, a pioneer for whom the creek was named.

Stevens had a secluded, shaded retreat along the creek amidst towering sycamores and oaks — until neighbors started hemming him in a couple of miles away. He sold out and moved. McCaulay in the late 1860's or early 1870's, local historians say, developed the spot into a summer resort—a favorite picnic spot for folks of the area.

The history is obscure until the early 1950's when the Nelson brothers acquired the property and later converted some of their land into a golf course. Soon Sigfrid Nelson's daughter and son-in-law, Mr. and Mrs. Jack Plata, and Albert's son and daughter-in-law, Mr. and Mrs. Eric Nelson, discovered the possibilities of developing a recreation area in the peaceful but brush-filled grove along the creek on the farm.

Brush clearing and building picnic facilities — barbecues, gas stoves, sinks, tables, benches—proceeded year by year. A couple of swimming pools add to the enjoyment.

Today, on a summer evening or weekend, thousands of men, women, and children make the grove ring with the sound of happy picnicking. A number of companies and fraternal and social groups reserve the place for their traditional annual outings.

The diversion dam on Stevens Creek, which once supplied water for the apricot orchard, now provides water for the large and small ponds, the water wheel, and the tiny little stream that meanders through the heart of the golf course — and provides the usual hazard to duffers.

It has become traditional for Americans to clamor for Government to do something about preserving historical and recreational sites. At Blackberry Farm, private enterprise is doing the job.

It could well be the only golf course in the country where you can nibble on an apricot—in season — while waiting your turn to play the next hole. — ROBERT F. TEGNER, *Field Information Specialist, SCS, Berkeley, Calif.*

Sigfrid Nelson stands beside a stone barbecue pit with swing-away grill, a homemade product, at the Blackberry Farm picnic grove.

Soil Conservation in Alaska

Subdistricts bring SCS technical aid to small farming areas of "The Great Land"

By Michael D. Hill
Soil Conservationist, SCS, College, Alaska

THE land called Alaska—rich in resources, vast in area, unique in reality, colorful in history — conjures scenes of endless ice and snow, fur-clad Eskimos with dog teams streaking across the frozen tundra, great herds of unmolested wildlife, and sparkling northern lights dancing against the blackness of the long arctic night.

"Last Frontier," "Land of the Midnight Sun," and "Seward's Folly" may come to mind. Facts and statistics explode many of these false impressions. For Alaska is a land of contrasts and extremes.

Many things make Alaska exceptional—homesteading and agriculture among the important. A Kansas wheat farmer may worry about his acreage allotment, a California cattleman the price of beef in the Chicago market. The Alaskan pioneer is concerned about clearing another 10 acres of wilderness or buying a much needed plow. The 49th State has only about 400 farms comprising roughly 80,000 acres. But the farmers are determined and devoted to successful farming. Problems and challenges facing the 20th century Alaskan homesteader and farmer are seemingly staggering. More have failed than have succeeded. High costs, limited markets, and insufficient capital claimed many.

One common bond links the Alaskan homesteader and farmer with his southern likeness — a sincere respect and love for the land expressed through the activities of local soil conservation districts.

North of the massive Alaska Range, 150 miles south of the famed Arctic Circle, is Fairbanks, second largest city and the major commercial center of interior and northern Alaska. The surrounding Tanana Valley is the northernmost agricultural area in America. Essential to the valley's farming endeavors are the Fairbanks and Salcha-Big Delta soil conservation subdistricts.

SCS provided seed of smooth sudangrass and red clover for forage trial in the Fairbanks subdistrict.

Jute matting lines a roadside ditch in a cooperative erosion control trial.

One Statewide District

Alaska differs from other States in having just one organized soil conservation district administered by the Alaska Department of Natural Resources. By law, this district includes the entire State; all local subdivisions are "subdistricts." As might be expected, programs of these subdistricts are distinctly different from those of other regions.

Alaska is not the coldest place on earth, as many believe. However, the Tanana Valley is noted for extreme seasonal temperatures,

and its mean annual temperature is 26 degrees. A sizzling 99 degrees once was recorded just north of Fairbanks. Record low is a chilly 66 degrees below zero—that's 98 degrees below freezing!

Normally the valley receives about 12 inches of water a year, with snowfall averaging 55 inches in Fairbanks and usually remaining on the ground from mid-October to mid-April. Because of the scant moisture, there are no glaciers in interior Alaska, a fact tourists find difficult to believe.

Crops grown in the Tanana Valley include oats, barley, grass forages, and a wide assortment of row crops. A few legumes are adaptable, but seed supply is scarce. Dairying and potato growing are the main farming operations, with cabbages, carrots, and lettuce also being produced commercially.

The growing season is short — 102 days—but the many hours of sunshine cause phenomenal growth in crops. From May through September, the total hours of light is nearly equal to 8 months at the equator. A day's work on the farm in the interior may literally end at midnight.

Soils of the Tanana Valley are alluvial, deposited by water, and upland or loess, deposited by wind. With adequate fertilizer, the soils produce good yields. Fairbanks subdistrict has more than 75,000 acres of class II land.

Permafrost a Problem

Permanently frozen subsoil — permafrost — is common throughout the valley—a source of amazement to the nonresident. Depth and thickness of the permafrost depend upon the vegetation, which acts as an insulation layer. Permafrost usually has ice in its veins, giving it a rock-like hardness. Removal of the vegetation often causes the ice to turn to water, the soil to mud, and life on a homestead a mess! In most cases, the problem is only temporary; as the permafrost recedes, so often does the melt water, particularly on well drained soils.

Supervisors of local subdistricts — whose personal experience plus foresightedness play a vital role in planning and directing a conservation program in a new land—represent a wide cross section of backgrounds: Farmer, big game guide, heavy equipment mechanic, teacher, and trapper.

Subdistricts provide technical assistance and information to more than 200 subdistrict cooperators and hundreds of other landowners through a Memorandum of Understanding between the subdistricts and the Soil Conservation Service. Assistance is given to newcomers searching for land to settle. Guiding settlement is important in insuring proper land use.

Soil Surveys in Demand

Greatest demand is for detailed soil survey maps which blanket over half a million acres in the Tanana Valley. Used for the homestead development plans — especially land clearing — map data help avoid costly mistakes. Nonagricultural use of soils maps has

Back steps of a residence in College, Alaska, show effects of melting of permafrost in a 3-year period.

A thick layer of moss on soil surface provides insulation against melting of permafrost until land is broken.

increased rapidly—by State and Federal land offices, tax assessors, real estate offices, and road departments.

As elsewhere, the framework for soil and water conservation practices is the farm plan. Group facility projects also have been encouraged. Two planned to date: A drainage proposal in the Fairbanks subdistrict entailing about 10,000 acres and an 8,000-acre flood control and windbreak job in the Salcha-Big Delta subdistrict.

The most widely applied practice in both subdistricts is land clearing. Large bulldozers are used during the winter months to remove heavy vegetation without disturbing the frozen topsoil. The cleared material is placed in windrows and burned at a later date. Soil conservationists work closely with landowners, selecting areas to be cleared and prescribing proper methods to use. Only land suited to the production of crops planned by the landowner is cleared. Costs range from $35 to $80 an acre and in a few extreme cases $100 an acre.

Where potatoes are the main crop, contour farming and other soil-saving practices are widely used by farmers tilling highly erodible silty soils. Crop rotation is a necessity, but shortage of cleared land hampers its use by most farmers. Soil fertility is maintained by the use of crop residues, fertilizer, and some green manures. Permanent grass seedings are important for the small but expanding dairy economy and as a much-needed soil conservation practice. Most commonly used grass is Manchar smooth bromegrass harvested for both hay and silage.

Wind Erosion Too

In the southeastern part of the Salcha-Big Delta subdistrict, wind erosion is the major problem. Besides using permanent cover, stubble, and rough tillage, farmers have established many windbreaks

Land clearing is one of the biggest problems facing farmers in the new agricultural areas of Alaska.

With SCS technical assistance, subdistrict cooperators in the area developed an overall windbreak plan. Strips of native trees are left intact at intervals during land clearing. Conservation thus unfolds on the land as residents work with what Nature provided.

Drainage problems are fairly widespread in the Tanana Valley, especially in the Fairbanks subdistrict. Hastening the thawing of permafrost by plowing often eliminates the problem as the excess water is able to percolate into the soil. However, ditches are sometimes required — no simple task when the land is too wet to support equipment. Dynamite to blast shallow ditches appears to be the long sought answer. Diversion ditches and grassed waterways are commonly used to intercept runoff and prevent serious erosion.

Both subdistricts fulfill a big need throughout the valley — an effective equipment rental program. Bulldozers, seeders, and plows help landowners apply conservation practices and allow subdistricts to carry out other conservation programs.

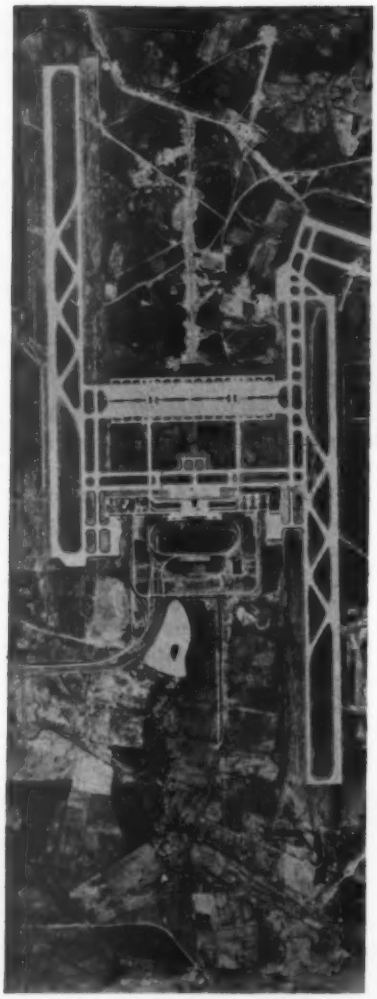
Newsletter Helps

Information and educational activities play a big role in both subdistricts. The two issue a joint bimonthly newsletter, *Conservation Corner*, which reaches over 350 persons with items of interest about programs, conservation ideas, farming tips, and news briefs. The letter forges a good link between supervisors and landowners, in an area where communications are somewhat inadequate. Twice during the past 3 years the newsletter has been awarded second place in Area VII of the NACD's national newsletter contest.

Youth of the area are not forgotten. Salcha-Big Delta subdistrict sponsors an annual 4-H conservation tour and contest. Winners get an all-expense trip to the annual 4-H camp. Several ribbons have been won by subdistricts for booth displays at the annual Tanana Valley Fair.

Interior Alaska subdistrict programs may not appear different, certainly not as big as those on the "outside." Yet there is a big difference. Far removed from other States, unmatched elsewhere in the Nation, men and women voluntarily engaged in soil and water conservation present a striking distinction: The job is tough and painstakingly slow. Agriculture is still a struggling infant.

As one bewhiskered sourdough summed it up: "Soil conservation is mighty important to this country; even the Indians knew that—after all, they named it 'Alaska' which means 'The Great Land'."



At Dulles International . . .

Airport Conservation Makes Good Neighbor

"CONSERVATION has helped give the Nation's capital a picture-window looking squarely into the age of cosmic travel."

Words to this effect are uttered by resources-minded visitors to vast, new Dulles International Airport. They observe skilled management of soil and water on a unique area of 10,000 acres lying athwart two counties. Greeting them is the phenomenon of the world's first and largest nonmilitary jetport.

More astonishing is the port's harmonious blending with the hills, streams, woodland, wildlife—and increasing suburbia — of scenic northern Virginia.

High-altitude vertical photo shows landscape pattern of Dulles Airport. Lake near center catches drainage from terminal and parking lot. Third runway angles off photo to right.

Dulles' builders were concerned primarily with the new era of supersonic transportation. This is evident in the 2-mile-long runways; more miles of high-speed taxiways; huge jetliner parking aprons; a towering, glass-walled terminal served by mobile passenger lounges; and a sprawling complex of navigational repair, maintenance, and traveler facilities. All the potentials for noise and confusion plus disruption of the neighborhood were at hand.

Advance Planning

Yet, today, the communities in nearby towns such as Chantilly regard the airport as a "good citizen." Visitors are informed that Dulles affords resource protection and improvements that actually make for happier, safer living in the surrounding countryside. For instance, it has helped to abate flood dangers that existed long before the skyport appeared on aeronautical drawing boards.

Neighbors were spared nuisance of Dulles' enormous construction activity by temporary vegetation that checked runoff and dust, basins that stopped silt from reaching local streams (Federal Aviation Agency photo).

Victories in conservation at the airfield were aided by local leadership teamed with a score of specialized county, State, and Federal agencies. Initial sparks were struck by supervisors of the Northern Virginia Soil Conservation District. They contacted heads of the Federal Aviation Agency in charge of the development. The district sought an evaluation of Dulles' impact on their efforts to guide scientific land use planning in Fairfax and Loudoun counties.

District board members had good reason to inquire. The population explosion in suburban Washington had struck them full force. A tide of new homes, shopping centers, industries, roads, and other pertinent facilities threatened to engulf them. Pressure on local landscapes could be equated to the need for a brand-new, 24-room school every month. The Soil Conservation Service conservationists and soil scientists were figuratively beseiged by developers and squad-

Two million pine seedlings form border to screen the activity and muffle sound of jetport traffic. Glenn Anderson, SCS soil conservationist, and Gilbert J. Tobin, horticulturist for Dulles Airport, check their growth.

Mowing is a big maintenance operation on the hundreds of acres of grass-covered grounds at Dulles (Federal Aviation Agency photo).

rons of bulldozers. Unguided assaults on the land brought a mounting toll in damage from silt, excessive runoff, and floods.

FAA officials welcomed the soil conservation district's experience in heading off problems the giant port might otherwise create.

Soils a Guide

Ultimately, Dulles' builders accepted a soil and water conservation plan. Except for its grand scale, it was not unlike coordinated operations pursued by millions of farmers and ranchers throughout the Nation's soil conservation districts. Methods of land treatment and uses were based squarely upon soils information furnished by the SCS.

Additional phases of resource-operations were guided by local experts in community planning, health, economics, recreation, parks, and forestry.

Throughout the 4-year period from ground-breaking to opening day ceremonies, contractors relied upon a system of cover crops to reduce the hazards of mud and dust. Temporary de-silting basins, urged by the SCS, guarded offsite streams from pollution. Topsoil was stockpiled to speed the eventual revegetation of bald areas.

Two airport workers spread mulch in a planting of azaleas near the terminal buildings.

Watershed Protected

An airport watershed project was modeled after the flood-relieving program familiar to hundreds of upstream areas across the United States. Dulles' watershed control work started with a concern for accelerated drainage problems bound to result from 1,000 acres of impervious pavement and roofing. Designs were later amplified to embrace the entire 15,000 acres of Horse Pen Run watershed. The project now controls runoff from much of the airport before the water reaches Broad Run on its way to the Potomac River, 25 miles above Washington.

Therefore, 60,000 residents along Broad Run's banks are safeguarded, for the first time in history, from storms of 100-year magnitude.

An outstanding attraction among Dulles' conservation features is Horse Pen Run's single flood-retarding structure. Its earthen dike rises 50 feet above the channel, to an elevation 270 feet above sea level. The 2-stage riser-outlet governs a permanent pool having 35 surface acres. This affords 32 million gallons of water storage for fire protection and recreational purposes. An ideal site for the basin allows the structure to hold back more than 15 inches of runoff before topping. At flood crest, the pool would increase to 500 surface acres.

The dam's unusual breadth accommodates a macadam, peripheral

Now part of the landscaping near the terminal buildings, this 10-acre lake served as a desilting basin during construction.

road graded to specifications of the Virginia Highway Department. The road crosses the 200-foot wide spillway on the contour safely below the control point. Thus the dike serves as a relatively inexpensive bridge. As such, it requires no unusual costs for maintenance or management. Forty feet beneath the spillway, the airport's main sewerline lies buried — an initial step in building the dam.

Two Million Trees

Hardy turf, shrubs, and other useful and ornamental vegetation have stabilized the soil for tomorrow's demands. A 1,000-foot-wide buffer belt of forest will muffle the sound of the airport traffic. Two million tree seedlings have already been planted on 1,500 acres.

If another example of Dulles' conservation were needed, it can be found in the soaring, futuristic terminal building designed by the well-known Finnish architect, Eero Saarinen. Capping the outward-leaning walls of sheer glass is a roof shaped much like a mammoth bathtub. As a matter of fact, it serves as a catch basin—draining off rainwater that supplies a nearby, decorative fish pond.

Airport officials confirm that resource programing will continue to parallel the refinement of facilities that already take care of flight traffic from the ends of the earth. They say the process of growth at the $100-million-plus establishment will very likely go on for at least 25 years. "By that time," they predict, "we may be handling rocket-ships."

Other more grandiose jet- and rocket-ports may be built as the space age unfolds. But Dulles, according to records of resource managers in northern Virginia, can hold rightful claims as the first of its kind to embrace conservation from the beginning on into the limitless future.—BERNHARD A. ROTH, *Field Information Specialist, SCS, Upper Darby, Pa.*

Solving Playground Problems Part of District Program

By George S. Brown
Work Unit Conservationist, SCS, Malone, N.Y.

SOLVING the playground problems of the Central School helped the Chateaugay, N.Y., people realize that the district conservation program is for the assistance of all landowners, not farmers alone.

The school was bothered by two problems on its new playground.

The grounds stayed wet late in the spring and after every hard rain. Children got wet feet, tracked in mud on the school's new floors, and made a mess of the struggling lawn.

The other problem was a wide hedgerow interlaced with rusty barbed wire and other hazards such as broken bottles and sharp stones. The school board was worried about this condition, especially after a call from one of the mothers that her boy had been scratched by the wire.

The school principal, Maynard Pilling, asked the Franklin County Soil and Water Conservation District for help. SCS soil conservationists suggested a conservation plan. It included 300 feet of diversion to intercept surface water and carry it safely away from the playground. It had a 700-foot outlet.

The hedgerow was first cleaned out, the valuable trees kept, and low spots on the school grounds filled.

Armand Trombly, who owns the farm adjoining the school property, needed an outlet for an open drain. So he and the school board agreed to make the conservation job a joint project. The outlet was constructed on Trombly's side of the boundary and the diversion on the school property.

As a result of "horse trading," Trombly paid the district for the contractor's equipment to build the outlet and the school paid for the hedgerow removal and the diversion. Rains just after construction proved the value of the diversion. Despite rain, the schoolyard stayed

A waterway constructed on the adjoining farm and now sodded provides outlet for diversion that protects school property.

in good condition. Both the farmer and the school board were pleased with the results.

A 1,500-foot line of 4-inch tile is planned to give the best possible drainage. Schools have budget problems too, Principal Pilling pointed out. So the tile will have to wait a while.

The Chateaugay Central School has 20 acres of red pine planted by the district in 1961. Several thousand shrubs for wildlife food and cover were also furnished by the district and planted by school children.

Joint Committee Reviews Plans on Watershed Wildlife

Improved procedures at field level for coordinating fish and wildlife conservation aspects of small watershed projects are resulting from the recent establishment of a joint committee of Soil Conservation Service and Fish and Wildlife Service representatives.

In Georgia representatives of the two agencies met to discuss questions raised by the Fish and Wildlife Service review of plans for the South Fork of Little River watershed. They resolved immediate questions and agreed on mutually satisfactory procedures for future projects.

The national committee is concerned mainly with implementation of policies and procedures for handling fish and wildlife opportunities and problems associated with the watershed projects. It formally considers only those individual projects with problems that cannot be solved at the local level by field representatives of the two agencies.

Members of the Committee from the Fish and Wildlife Service are James T. McBroom, assistant director, Technical Services; William M. White, chief, Division of River Basin Studies; and F. S. Henika, chief, Special Studies Section, Division of River Basin Studies; and from the Soil Conservation Service, Hollis R. Williams, deputy administrator for Watersheds; John H. Wetzel, director, Watershed Planning Division; and Lawrence V. Compton, head biologist, Plant Technology Division.

SCS PHOTOS GREET VISITORS AT DULLES

A selection of the best photos from SCS's "America the Beautiful" and "Water for America" series greets arrivals to Dulles International Airport.

Many foreign visitors now enter the United States through this terminal, and the pictures give them a quick introduction to the geography, the resources, and the conservation activities of the Nation. They have a permanent location in the spacious concourse whose glass walls add airiness to the building.

The exhibit has created considerable interest among the visiting and local VIPs as shown by the calls and letters received by the Washington SCS office — such as those from a Texas business man, the Japanese Embassy, the mayor of a city in western Washington, head of a fertilizer institute, a railroad in the midwest, and a chemical company in California.

NEW FACILITIES FOR CONSERVATION RESEARCH

Expanded facilities for soil and water research are being established by the Agricultural Research Service at four locations in the United States.

The Snake River Conservation Field Station at Twin Falls, Idaho, and a new laboratory at the Palouse Conservation Field Station, at Pullman, Wash., are in operation.

Under construction are the Coastal Plains Conservation Field Station at Florence, S.C., and the Northern Plains Soil and Water Field Station at Sidney, Mont.

SCS Helps Repair Land Damaged by Montana Flood

By P. E. Farnes
Acting Snow Survey Supervisor, SCS, Bozeman, Mont.

RAMBLING streams and nonchalant rivers became elements of horror and destruction the second week in June when Nature released upwards of 10 inches of precipitation on the melting snowfields and mountains of northwestern Montana.

When the rivers and streams finally receded, they left behind an estimated $70 million in property damages. Some 30 persons were dead or missing.

Front page coverage in the newspapers is gone; now the hard work of rebuilding lies ahead.

As soon as water began to recede, SCS conservationists and technicians were in the field. New irrigation ditches were surveyed to provide water for land still having a possibility of producing a crop this year.

Hydrologists checked flood flows and design figures for a watershed protection plan being prepared for Birch Creek below Swift Reservoir. The application had been received before the flood.

SCS Moves Men

Downstream, agricultural land required much work to restore full production. The SCS transferred additional personnel into those areas, to assist farmers and ranchers recover as soon as possible. It is estimated that 1,500 man-days of technical work will be required.

Immediately after the flood special snow surveys were made to assess the potential for additional flooding. Measurements were made on June 16 to 18 at 27 high elevation snow courses in Montana.

Even after the heavy rainfall and much melt, the snowpack was still large. Many locations had as much snow the third week in June as is normal for the last week in May. The potential was still high for more flooding should warm temperatures be accompanied by moderate to heavy rainfall.

But Nature did not unleash her fury again. Rivers and streams continued to run bank-full into July with only minor flooding.

What caused the worst natural disaster ever to hit Montana?

According to early reports from valley and foothill areas, 5 to 11 inches of rain fell in 30 hours. This amount was probably exceeded in the mountains.

Rain, falling on the melting snow, increased its rate of melt. Surfaces not snow-covered contributed substantially to the runoff, since most of the soils were still saturated from recent snowmelt.

Similar quantities of rainfall on either a cold snowpack or on dry soil would not have produced as much runoff. It could have been larger only if the soils had been frozen.

Earlier in June the future looked bright. Irrigation reservoirs were filling with runoff from the melting mountain snow. The area was finally receiving moisture after 5 years of semidrought. Crops were a little slow because of the cool spring, but would respond to warming temperatures.

Snowmelt Was Late

Earlier in the winter, snow accumulation in the mountainous headwaters was below average. During April snowmelt was well below average because of the cool spring. On May 1 the measured snowpack was about 20 percent above average for that date. Cool weather continued through May, keeping the snow in the mountains. Early in June, temperatures began warming and snowmelt raised streams to nearly bank-full, but not to flood stage.

Then the deluge hit.

Crops were swamped. Livestock was carried away. Roads, bridges, railroads, and fences were no more. Water stored in irrigation reservoirs rushed down the Missouri River after dams gave way.

Swift Reservoir on Birch Creek, unable to withstand the surge of water, collapsed — adding nearly 30,000 acre-feet to the already swollen streams. Lower Two Medicine Reservoir and small city water supply dams also burst.

Potential Flood Danger

The 1964 Montana flood reminds us that in this mountainous region we must live with unpredictable flood hazards. Snow surveys can forecast the total water yield of a drainage area with reasonable accuracy, but they cannot foretell when a combination of weather conditions may bring the water supply—whether large or small—down at flood rates.

Each spring in Montana presents a potential for devastating floods. The western part of the State is mountainous and the majority of the watersheds are snow-covered throughout the winter and into spring.

The peak flow of a river each year is not simply a function of volume of snow; it is related even more to temperature and precipitation during snowmelt. As happened in 1964, serious floods may occur from a snowpack that is below average during the winter months.

This yearly flood potential makes it urgent for Montana land owners and conservationists to make needed land use changes and complete watershed treatment to provide reasonable protection from the inherent hazards of the environment. Even with today's modern technology, the solution is not an easy one.

LAND LEVELING IS INVESTMENT FOR RANCHERS

A $35 AN ACRE investment begun 10 years ago in the leveling of irrigated hayland for greater efficiency is expected to bring within 2½ years a 40-percent return to two brothers near Steamboat Springs, Colo.

When John (in photo) and Stan Fletcher bought the 1,900 acres of ranchland along the Elk River, 260 acres was of average production, but the high and low places were of low yield. After a while the Fletchers also discovered they were in need of more hay to carry their livestock through long winters.

The brothers became cooperators with the East Routt Soil Conservation District and developed a long range soil conservation plan. They decided to level the irrigated land for greater efficiency. They would do the job at the rate of 20 acres a year.

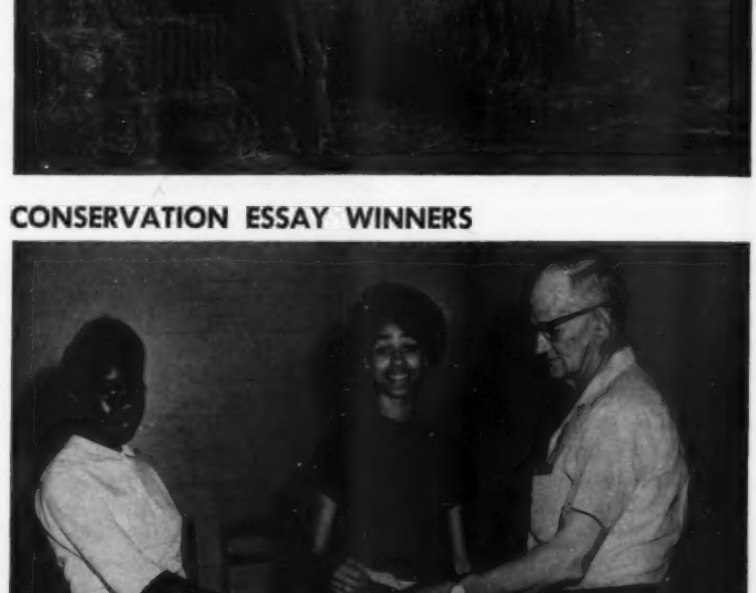
The brothers investigated the cost of having the work done, then decided to buy a 2-yard scraper and tackle the job on their own.

First, they plowed the field in the fall. The next spring they plowed it again, smoothed and seeded it to oats. The following fall SCS technicians lent a hand with the engineering involved, designed the leveling job, and set the stakes.

Final touches completed, they planted a grass-legume mixture. Subsequently yields were from 3 to 4 tons of good quality hay an acre. The Fetchers have leveled 190 acres.

Said John Fetcher, "We think we have top production from this land now, but once you get top production you have to keep at it to maintain that level. Irrigation water management after you have leveled land is one of the most important parts of the job."—BRUCE A. LINDAHL, *work unit conservationist, SCS, Steamboat Springs, Colo.*

CONSERVATION ESSAY WINNERS



Among the many conservation essay contests sponsored by soil conservation districts is that of the Lee County Soil and Water Conservation District of Arkansas, open to high school students.

Here Harvey Wilson, chairman of the Board of Supervisors, presents cash awards to winners from the Anna Strong High School: Carthelia Jordan (center), first, and Lela Dukes, second.

State Highway Construction And Soil and Water Conservation

By M. J. Snider

Chief Engineer, Missouri Sate Highway Department

These remarks are excerpts from an address to a statewide staff conference of SCS soil conservationists in Jefferson City, Mo., June 18.

For many years the Soil Conservation Service has enjoyed excellent cooperation with the Missouri State Highway Department in roadside erosion control work and related activities.

Typical of the joint projects are two combination floodwater-retarding and stabilization structures that replace bridges in the East Branch of the South Fork of the Blackwater River Watershed Project.

In the Pike County Soil and Water Conservation District the Highway Department permits the board of supervisors to use highway rights-of-way for Reed canarygrass sod banks for use of local farmers and is cooperating in an evaluation study of trailing raspberry for bank stabilization. — HOWARD C. JACKSON, *State Conservationist.*

THE Missouri State Highway Department realizes that sound programs of erosion and drainage control are good investments. It is an established fact that such measures, undertaken during construction of a new highway, save money in the long run because future maintenance costs on the road are considerably lower. Also, the prevention of damage to pavements, shoulders, and bridges from water action provides for safer and more convenient operation of vehicles by motorists.

During calendar year 1963, the Missouri State Highway Department carried on a construction and right-of-way program amounting to about $175,700,000. Out of this, $3,185,000 was used entirely for erosion and drainage control programs which already had been proved workable and beneficial.

A breakdown shows the following categories of work and money for each purpose: Paved ditches, $981,000; concrete slope protection, $170,000; fiberglass matting for drainage ditches, $112,000; interception ditches, $36,000; erosion control netting, $48,000; sodding $586,000; seeding, $437,000; mulching, $576,000; and rock fills and revetments on river and stream banks at bridges and box culverts, $239,000.

Land Use Changes

All of us are aware that any changes in land use — whether it be in farming methods, home and commercial construction, or highway building—disrupt established drainage patterns because the natural state of the land has been disturbed.

For example, heavily urbanized areas present special problems in attempting to deal with water control to prevent flooding and erosion.

A new highway built in St. Louis County and running, for instance, past an open 80-acre field probably would call for only routine drainage control measures to take care of runoff and erosion as long as the adjoining land stays in its same state.

But suppose this field is developed intensively with houses, industry, and huge shopping areas with parking spaces for hundreds of automobiles. This would change the whole complexion of the situation.

Obviously, with roofs of buildings, new streets, driveways, and surfaced parking lots, there will be tremendous increase in water runoff because open ground areas to absorb precipitation would be cut drastically. This excess water must be taken care of if there is not to be severe flooding, with its resulting damage and inconvenience.

So in designing erosion and drainage control features for new highways in these expanding urban areas, we attempt to gain as much knowledge as possible in anticipation of future changes.

Information that is very helpful to us, for example, is projected land use data and local zoning designations. Of course, if a highway is designed under a certain zoning designation, and then that designation is changed in the future, there could be trouble ahead.

Erosion and Runoff

Let's turn to the rural areas now and see what the State Highway Department does in soil and water control measures there. . . . Watershed runoff and historic flood data are two of the key pieces of information the department uses in determining the height of roadbeds and bridges and the design of drainage facilities. This is true for urban and rural areas.

Naturally, we all know that flood records in particular areas frequently are broken, and this sometimes will cause a highway to be flooded. But we believe historical flood data provide the soundest guide we can use . . . Historical flood data are revised upward by the Highway Department when unusual storms occur.

Another vital factor in setting erosion and flood control designs for highways is soil testing. Extensive tests are made for each project and the results evaluated. Different drainage and erosion control measures are required, of course, where erosive soil exists than in nonerosive soil areas.

It also is important to note that the State Highway Department employs a full-time graduate agronomist. One of his main duties is to determine the best type of grasses and other ground covers to plant along rights-of-way to prevent erosion and beautify the highway.

Agency Cooperation

I want to mention, too, the cooperative efforts which we carry on with other groups.

The State Highway Department works closely with the U.S. Corps of Engineers in designing bridges and highways to be built in areas under the Corps' jurisdiction. Examples of this are bridges constructed over the Mississippi and Missouri rivers and roads and bridges that are relocated through lake areas.

The Highway Department also has a Memorandum of Understanding with the Missouri Conservation Commission. The memorandum provides for the exchange of programs and preliminary study information whereby the efforts of the two agencies are co-ordinated toward the reduction of damage to Missouri's fish and wildlife resources.

Research plays an important role in the State Highway Department's program of erosion and water control.

Soil Conservation

In 1957 the department awarded a contract for building about 16 miles of U.S. Route 24 in Lafayette County. The highway was to cut through land that had been intensively terraced at considerable cost to adjacent landowners.

The landowners and soil conservation people were interested in the department designing the highway so as not to change the soil conservation factors then existing.

Under the department's design policy at that time, the high velocity of water outflow through culvert pipes would have caused extensive damage to existing ditches and terraces.

The department was happy to cooperate with the Soil Conservation Service and Lafayette County Soil and Water Conservation District in attempting to find an answer to the problem. A new type of headwall for cutting down the velocity of water coming through culvert pipes was designed for the pipes by our Division of Surveys and Plans. The new headwall resulted in reducing the water velocity coming out of a pipe about 4½ to 1.

The cost of the new headwall was considerably more than the standard headwall normally used. The adjacent property owners agreed to pay the difference to test the design as a research project.

A total of 30 culvert pipes ranging in size from 18 to 42 inches in diameter was installed. Cost to the landowner was $250 on each 18-inch pipe and $950 on each 42-inch pipe.

So successful was the project that these headwalls now have become a part of the department's standard specifications in areas of Missouri where erosive soil exists.

Fiberglass Matting

Another successful research project involved the use of fiberglass matting, instead of concrete, for drainage ditches requiring a surface.

The test was carried on along a highway in Callaway County late in 1961. The fiberglass was simple to install, since it comes rolled up like a blanket.

It was spread on a graded surface and anchored to the ground with "T" pins. Asphalt then was sprayed on the blanket to add strength and weight and also to seal it. The asphalt was covered with rock chips to add more strength, provide protection against abrasion, and catch silt to make a smooth surface.

The performance of the fiberglass was checked after experiencing all types of weather conditions, and the results were found highly satisfactory. Moreover, it costs about 30 percent less than concrete to install by contract. As a result of this successful research project, fiberglass matting now is being used rather extensively for this type of work by the department in areas with erosive type soils.

The Missouri State Highway Department will continue to expand its programs of research, cooperation, and action in matters pertaining to conservation so the needs of the public can be served even better in the future.

Conservation Quotes

"As long as our streams run red, as long as our creeks and rivers flood fertile bottom land, as long as crops suffer and die because of too much or too little water, as long as gullies scar out hillsides, and as long as any farmer and his family live in want because land is abused or water wasted—our job is never finished."—Dr. J. B. Douthit of the Pickens (S. C.) Soil Conservation District.

"We abuse land because we regard it as a commodity belonging to us. When we see land as a community to which we belong, we may begin to use it with love and respect."—Aldo Leopold.

◆

University of Nebraska Engineer James Pichon designed a robot-controlled tractor that starts, stops, blows its horn, and raises or lowers implements at predetermined points without the aid of man.

Unified Planning

(*Continued from p. 29.*)

village officials were prompted to apply to their own district headquarters for soils inventories and maps "like those in the Hanover Report." Furthermore, they proved willing to share in the costs of making the surveys and producing the interpretive materials. This tangible support served to amplify the districts' ordinarily limited manpower and the service was thereby accelerated.

Survey and interpretation assistance has, to date, been furnished to 14 towns, and 12 others have contracted for reports now under development. Two multitown regional areas have also contracted for more generalized surveys, and several communities where swift urbanization is expected have asked for detailed data. Thirty-six other towns are awaiting their turn. For this and associated work, the entire SCS soil survey staff in Massachusetts is scheduled into 1966.

At the heart of the current movement is a "natural resources evaluation" procedure which many communities follow in preparing their master plans. The conservation districts provide the technical information for the resource inventory. Steering committees representing town-wide governmental interests prepare lists of community objectives on water supplies, population, economy, and other factors that affect their future.

Resource teams provided through the districts then work with the planners to insure that no interrelationships, no alternative sites, and no optional land uses are overlooked. The culmination of such an approach results in more tangible and realistic master plans. Such a master plan includes a "Future Land Use Map" matching town objectives with its "storehouse" of resources.

Vital followup is also provided by conservation districts. Help is given in planning and scheduling operations where natural resource use and protection are clearly involved. Finally, the district remains at the side of the community officials in the design and supervision of all measures where the welfare of the natural environment is at stake.

The steps underway fulfill much of the philospohy of the Rural Areas Development and Technical Action Panel concepts currently being advanced by the Department of Agriculture. Rural and urban interests have been given an effective means of working together harmoniously.

Capital Residents Get Field Courses In Natural History, Conservation

A unique conservation education program that reaches key Government employees, officials of national conservation organizations, and urban residents of the Nation's capital is conducted by the Graduate School, U. S. Department of Agriculture. The Soil Conservation Service provides several of the instructors.

The special program of "Natural History Field Studies" is carried on in cooperation with the Audubon Naturalist Society of the Central Atlantic States, with headquarters in Washington. Field courses in fall and spring take students to examples of the principal ecological communities of the region and give them an opportunity to observe conservation and land-use problems and their treatment.

In the 3 years the program has been in effect more than 250 people have enrolled in 1 or more of the 16 courses offered. Each course gives 1 hour of college credit.

Students have included one congressman, congressional staff members, several high-ranking employees of the major executive departments, including Agriculture and Interior, military officers, and officials of conservation organizations.

SCS employees helping to teach the courses are Robert E. Williams, Resource Development Division; Ben Osborn and A. B. Foster, Information Division; and Earle D. Matthews, soil scientist on the Maryland State office staff.

Members of class in "Introduction to Outdoors" quiz Paul Pearson (bareheaded), cooperator with the Montgomery County, Md., Soil Conservation District, about his operation of a shooting preserve.

CONSERVING AMERICAN RESOURCES. By Ruben L. Parson. 2nd ed. 1964. Prentice-Hall, Inc., Englewood Cliffs, N. J. 521 pp., illus. $8.95.

This second edition strengthens and brings up to date Dr. Parson's popular book on conservation. In it teachers have a reliable and readable book for classroom use; laymen a lively, stimulating discourse on one of the Nation's most vital concerns—the whole range of natural resources on which our very life depends.

The book follows closely the pattern and content of the successful first edition. The material has been reorganized somewhat to present a more logical sequence; some new material added, including a chapter on "Mineral Fuels and Major Metals;" and the statistics and references carefully brought up to date.

This is a book that squarely and forthrightly presents the central thesis of the conservation movement as represented by the Soil Conservation Service and soil conservation districts. Naturally, much of the information has been obtained from those sources. The activities and subject matter of other agencies of the Federal Government, and of academic and private institutions, have been generously used as well.

The book assumes "an optimistic viewpoint;" in fact, the first paragraph carries just that label as a marginal heading. The optimism is reflected throughout in a readable and piquant style.

The author's definition of conservation will convey something of the philosophy and flavor of the book:

"Conservation of natural resources means the fullest possible use of them without abusing the ones exploited, without destroying any needlessly, and without neglecting any that can be used. It is not necessarily 'conservative' in the ordinary sense of the word. It means thrift, but not denial; frugality, but not privation; efficiency, but not austerity."—B.O.

New Publications

Water Facts. By Soil Conservation Service. *Issued Aug. 1957. Rev. May 1964. USDA PA-337. 14 pp., illus.* Water sources, supply, needs, uses, losses, floods, and conservation with some emphasis on recreation and wildlife.

The Work of the Soil Conservation Service. *Rev. June 1964, USDA SCS- CA-4. 7 pp.* Summary of activities of SCS with citations of legislative authority.

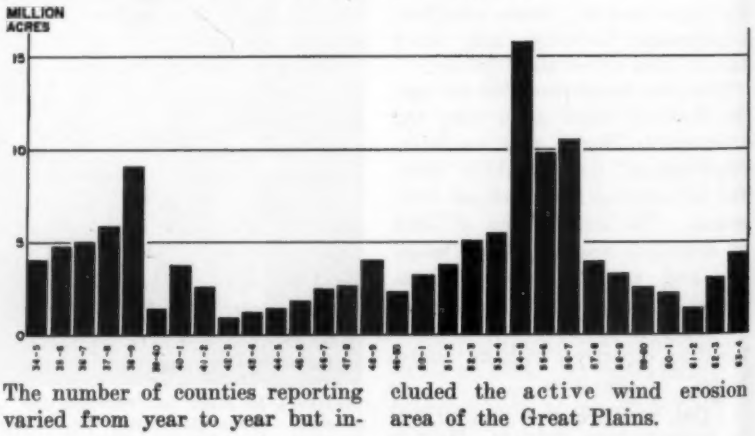
Local Secondary Effects of Watershed Projects—A Case Study of Roger Mills County, Oklahoma. By J. Dean Jansma and W. B. Back. *May 1964. USDA ERS-178. 28 pp.* Local economic benefits of watershed projects arise from (1) net primary income, or increases in net incomes of the direct recipients of products and services from the projects, and (2) net secondary income, or increases in net incomes of other local people through multiplier effects of the primary income. Local primary income has been estimated by the SCS in the process of project planning. Practical methods for making reliable estimates of local secondary income in the planning process are yet to be developed. This study represents an initial step in research to devise these methods.

Pesticide-Wildlife Studies. By John L. George. *June 1963. U. S. Dept. of Interior, Circ. 167. 109 pp.* A review of Fish and Wildlife Service investigations during 1961-62.

Land Damaged by Wind Erosion in Great Plains

The final report of wind erosion conditions for the 1963-64 blow season showed the largest acreage damaged of any year in the past 7, and an upward trend in area damaged during the past 3 years. Estimates from local SCS offices in 183 counties in the 10 Great Plains States indicated 4,295,937 acres damaged.

The 30-year record of wind erosion damage includes data from the Great Plains Council for the period 1943-44 through 1952-53, from SCS for the other years.



The number of counties reporting varied from year to year but included the active wind erosion area of the Great Plains.

From the Administrator:

SCS Services To Urban Areas

THE applied programs of the Soil Conservation Service have long contained bonus benefits for the individual and groups — both rural and urban. Benefits from the work of SCS today extends increasingly to the nonagricultural land user.

Direct technical assistance is being provided for school grounds through protection from erosion by controlling excess water runoff. Assistance on runoff problems is being provided for airports and highways. And States and municipalities find SCS technical assistance an invaluable asset in stabilizing and developing recreation areas.

Still another SCS program containing nonagricultural benefits is the National Cooperative Soil Survey, the basic tool of our profession. The soil survey used to guide land use adjustments for the orderly planning and application of soil and water conservation on farms, ranches, and watersheds, is now paying dividends for the nonagricultural user as well.

Many soil survey interpretations that aid in establishing soil and water conservation measures on the farm can be used equally well for nonagricultural purposes, such as locating soils for housing, sewage disposal, industry, highways, airports, and general town planning.

Using the soil survey, industry finds the proper place to build, homeowners and builders locate the best place for houses and septic tanks, and counties and municipalities choose the proper sites for reservoirs, highways, pipelines, and sewage systems.

Annually SCS is providing soil surveys for about a million acres in areas of urban expansion. In fiscal year 1964 the million acres involved 70 urban areas. The work in these areas is being carried out in cooperation with soil conservation districts, much of it with financial assistance from towns, counties, and municipalities.

As urban planning groups become more aware of available soil survey information, requests for such information will increase. Indications are that city planning commissions are the groups most interested. In fiscal year 1964, 32 urban planning groups in 12 States signed agreements with SCS for soil survey information.

Soil conservation districts in many States are also beginning to realize the value of the soil survey in urban planning. District programs are being updated and revised to include assistance to land users in urban-fringe areas and municipalities.

Districts are leading out in this movement and are working with urban planning groups to plan for all the needs of the community, both rural and urban. This is a trend that is pronounced in the northeastern urbanized area. It is a trend we believe should and will be followed by other soil conservation districts containing areas of urban expansion.

SCS has the technical know-how and long years of experience that town planners, State agencies, and individuals find valuable in developing the natural resources of the community. We have made good use of this experience and knowledge in the past. We are making good use of it now. We will make far more use of it in the future.

As our population increases and cities and towns spread more and more into rural areas, soil surveys will play an even larger role in the development of these areas. Through proper planning we can meet these additional demands on the land while striking a blow at rural poverty and heading off the specter of rural-urban slums.

Unlike many less fortunate countries, the United States has enough land to meet the many needs of the individual and public and private organizations. But with a million acres of land going out of agriculture each year, mostly from cropland to urban-fringe areas, we must apply wise planning to this land use shift.

Using the soil survey as a starting place, the SCS for nearly 30 years has practiced applying soil and water programs suited to each acre of land. During that time the problem of soil erosion has been dramatically diminished.

Through the small watershed program, towns and cities have gained new life by curbing floods and making multiple use of water impoundments.

Now we are faced with the challenge of using the experience and knowledge gained from these programs to help solve the rural-urban competition for land. Here we must plan to meet the needs of both rural and city people and still maintain an adequate agricultural base. The nature of the soil survey makes it a key tool for meeting this challenge.

The multipurpose concept used in applying SCS practices and programs will pay dividends in the years ahead. We need only to include these urban area needs in our regular planning and gear our efforts to meet them. The time has come to put to work some of the planning we have done and prepare for additional responsibilities in a growing America.

—D. A. WILLIAMS

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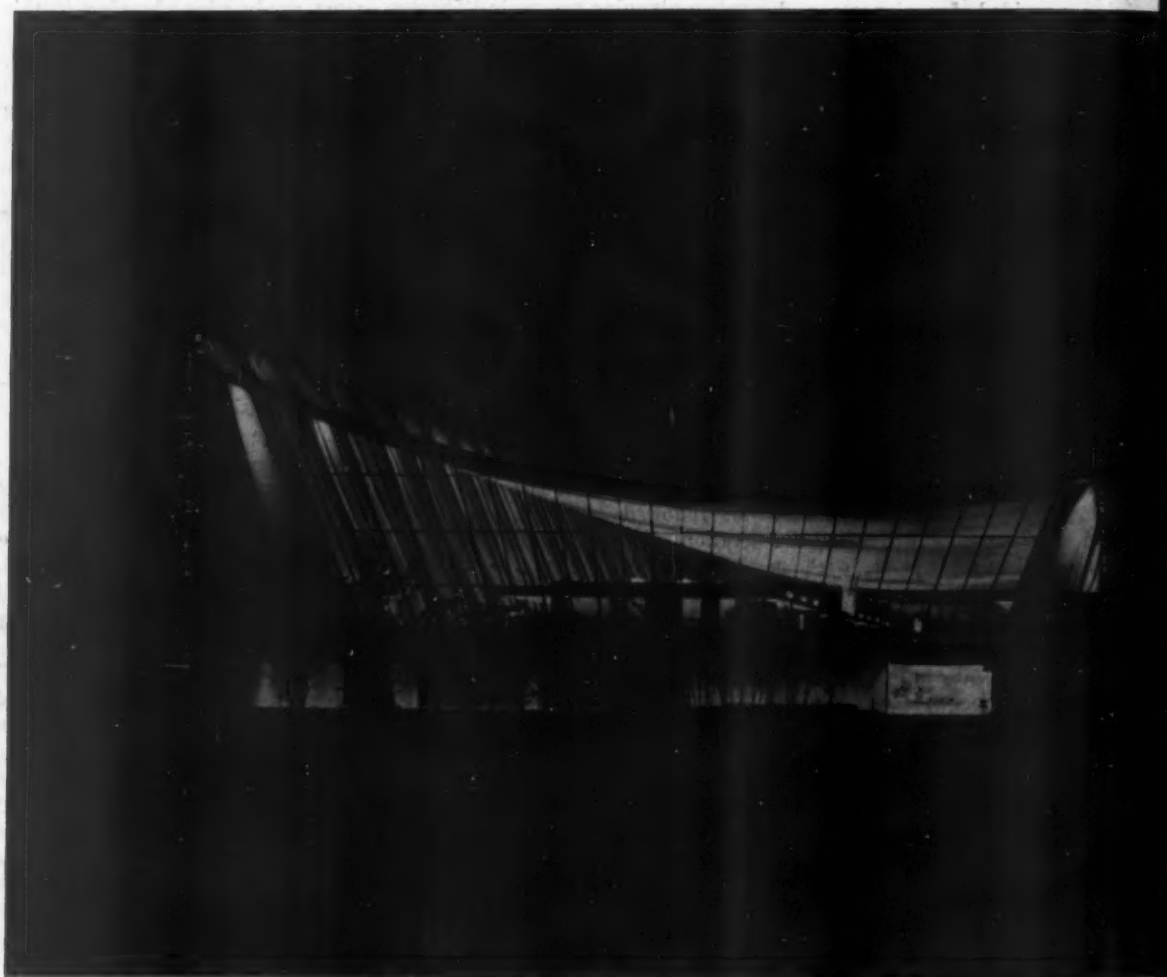
If your address changes, please notify us of your complete new address, including zone or RFD number, and include old address with our code number as shown above.

Conservation at the Jetport

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